

**STANDARD OPERATING PROCEDURE NO. 11**

**SEDIMENT COLLECTION  
USING VIBRACORING DEVICE**

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### **3.0 PURPOSE AND SCOPE**

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The purpose of this document is to define the standard operating procedure (SOP) for collecting cores using a vibracoring device as part of the Newark Bay Study Area Phase III Quality Assurance Project Plan Amendment (Phase III QAPP).

This SOP describes the equipment, field procedures, materials, and documentation procedures necessary to collect cores. Specific information regarding coring can be found in the Phase III QAPP.

This SOP may change, depending upon field conditions, equipment limitations, or limitations imposed by the procedure. Substantive modification to this SOP shall be approved in advance by the Facility Coordinator (FC) and the United States Environmental Protection Agency (USEPA) Remedial Project Manager. The ultimate procedure employed will be documented in the Newark Bay RI Report.

Other SOPs will be utilized in conjunction with this SOP, including:

- SOP No. 1 – Locating Sample Points Using GPS;
- SOP No. 2 – Positioning;
- SOP No. 3 – Decontamination;
- SOP No. 4 – Management and Disposal of Residuals;
- SOP No. 8 – Documenting Field Activities; and
- SOP No. 12 – Core Processing.

## **4.0 PROCEDURES**

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Cores may be collected using a vibracoring device. Following collection, cores will be transported to the sample processing area. Core processing procedures are described in SOP No. 12 – Core Processing.

### **4.1 EQUIPMENT LIST**

The following equipment list contains materials which may be needed in carrying out the procedures outlined in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- personal protective equipment (PPE) and other safety equipment, as required by Phase II RIWP HASCP [Rev. 1] (Tierra, 2007);
- navigation charts and Phase III Sediment Sampling Program Proposed Locations figure;
- sampling vessel adequate for Newark Bay conditions;
- project Quality Assurance Project Plan
- marine VHF radio;
- positioning equipment;
- vibracore device;
- deployment equipment (e.g., A-frames, winches, winch cable marked in 1 foot increments, generator);
- sounding pole
- decontaminated Lexan core tubes;
- decontaminated stainless steel core catcher;
- core caps
- hacksaw;
- decontaminated hacksaw blades;
- Daily Activity Log, Core Collection Form, and Individual Core Collection Form;
- core storage racks or cooler to hold cores vertical and cold during temporary storage on-board coring vessel;
- assorted nautical equipment (e.g., anchors, lines, personal flotation devices [PFDs]);
- logbooks and associated field forms;
- permanent marker or grease pencil;
- fathometer with a resolution of 0.1 foot;
- tape measure;
- submersible pump and hose;
- duct tape;
- camera; and
- decontamination equipment/supplies.

### **4.2 SAMPLING PROCEDURES**

This section gives the step-by-step procedures for collecting cores using a vibracore. Observations made during sediment core collection should be recorded in the Daily Activity Log, Core Collection Form, and Individual Core Collection Form, and a logbook (SOP No. 8 – Documenting Field Activities).

#### **4.2.1 DECONTAMINATION OF EQUIPMENT**

Decontamination of the Lexan core tubes and stainless steel core catchers will be performed prior to vessel departure in accordance with procedures outlined in SOP No. 1 – Decontamination. The decontamination activities will occur on shore and will be conducted with enough time before vessel departure to allow for the decontamination activities to be completed (including drying of decontaminated equipment). Additional decontamination equipment and expendable supplies will be carried aboard the coring vessel in the event additional decontamination activities are needed.

#### **4.2.2 LOCATING CORING POSITION**

1. The coring schedule for the day will be established prior to vessel departure, and sufficient equipment to complete the work will be on board the sampling vessel. The coring crew will be informed prior to departure of the coring locations and the number of cores required at each location. Two cores (nominal 4-inch diameter) will be collected at each location. Based upon the core diameter, sample interval, moisture content, and 75 percent core recovery, two cores are sufficient to meet the mass requirements of the analytical program. If the core recovery is greater than 90 percent, one core rather than two cores may be collected. Additional cores may be needed at identified locations to collect sufficient sediment mass for field duplicates and MS/MSD samples.
2. The vibracoring vessel will move to a coring location in accordance with SOP No. 2 –Positioning.

#### **4.2.3 COLLECTION OF CORES**

1. Complete Daily Activity Log and Core Collection Form.
2. Don PPE as required by Phase II RIWP HASCP [Rev. 1] (Tierra, 2007).
3. Activate the submersible pump in preparation for cleaning the vibracore and coring tube, upon retrieval.
4. At each coring location, one attempt will be made at coring without the use of a core catcher. If the sediment is retained in the core tube, then proceed with collecting a second core at that location, if needed based on the requirements described in Step 1 of Section 4.2.2, without a core catcher. If the sediment cannot be retained in the core tube, the vibracore operator will evaluate whether to try a second attempt without a core catcher, based on vibracoring conditions. If, based on the vibracore operator's professional opinion, a second attempt without a core catcher may be successful, collect a second core without a core catcher. If, based on the vibracore operator's professional opinion, a second attempt without a core catcher will not be successful, attach a core catcher to the bottom of the core tube and collect a core.
5. Slowly winch the vibracore into its deployment orientation.
6. Obtain water depth (to nearest 0.1 foot) from the sounding pole or fathometer and record on Individual Core Collection Form.

7. Slowly lower the vibracore into the water using the winch or other deployment equipment.
8. Slowly lower the vibracore through the water column to the sediment surface using the water depth reading.
9. Record the “zero” mark on the winch cable.
10. Lower the vibracore into the sediment until initial refusal. If the target depth has been reached, proceed to Step 11; if not, start the vibracore motor. Record the start time on the Individual Core Collection Form. Slowly penetrate the sediment to the target penetration of 1 foot, or refusal.
11. Lower vibracore approximately 1 foot more to obtain a “plug” at the bottom of the core (i.e., to minimize loss of sediment from core). Record the end time on the Individual Core Collection Form.
12. On completion of the required penetration, or upon vibracore refusal, turn the motor off. Record the vibracore penetration depth on the Individual Core Collection Form.
13. Record the final core location coordinates on the Core Collection and Individual Core Collection Forms.
14. Slowly raise the vibracore, while maintaining the core in a vertical position as field conditions allow.
15. Bring vibracore to sampling vessel deck while maintaining the core in a vertical position. Remove core catcher (if necessary), replace with cap, and secure cap with duct tape.
16. Clean the vibracore barrel and coring assembly by hosing down the equipment with Newark Bay water as described in SOP No. 1 – Decontamination.
17. Remove the core tube from the vibracore, keeping the core tube in an upright position, as field conditions allow.
18. Return the vibracore device to its onboard, deck storage location.
19. Clean the core tube by hosing it down with Newark Bay water. Care should be taken not to direct water into the open end of the core tube.
20. Evaluate whether core penetration and recovery are acceptable using the procedures outlined in Sections 4.2.4 and 4.2.5, respectively. [Note: When clay is encountered prior to achieving the target depth, procedures used to determine acceptable core penetration will no longer be applicable. For example, if a clay plug is encountered during the first attempt, no additional attempts shall be made. In cases where coring personnel believe that clay was encountered prior to achieving the target depth, but a clay plug was not recovered in the core, up to 3 attempts may be made at that location to obtain a clay plug.]
21. Keeping the core tube upright, as field conditions allow, use a hacksaw with a decontaminated blade to make a cut in the core tube just above the sediment/water interface to allow excess water to seep from the core tube. When the overlying water has been removed from above the sediment/water interface, cut off excess top of the core tube using a hacksaw with a decontaminated blade.

22. Cap the top of the tube, secure the top and bottom caps with duct tape, and draw an arrow toward the top cap. Draw an arrow on the coring tube with permanent marker and label "top" to indicate the top of the core. Label the core with the location ID, date, and time, and record this information on the Individual Core Collection Form.
23. Measure the recovered length of the sediment in the core tube (to the nearest 0.1 foot to the extent possible) and record it on the Individual Core Collection Form. The distance between the top of the sediment in the coring tube and the bottom of the coring tube corresponds to the recovered length. Apparent gaps should be noted on the Individual Core Collection Form and the length and location(s) of the gap(s) should be noted. The total gap length will be subtracted from the total recovery length.
24. Store the core vertically in a core storage rack or cooler (capable of keeping cores cold) while on the vessel until it can be transported to the sample processing area.

#### 4.2.4 PROCEDURES FOR DETERMINING ACCEPTABLE CORE PENETRATION

1. Calculate penetration percentage using the following equation:

$$\text{Penetration (\%)} = \frac{\text{actual penetration (feet)}}{\text{target penetration (feet)}} \times 100$$

Actual penetration is the depth advanced into the sediment not including the depth advanced to form a plug.

2. Record penetration percentage on the Individual Core Collection Form.  
If penetration is  $\geq 75\%$ , then penetration is acceptable. Proceed to Section 4.2.5, Procedures for Determining Acceptable Core Recovery.
3. If penetration is  $< 75\%$ , then (a) retain core and (b) record on the Individual Core Collection Form if due to refusal. Record additional penetration notes at the Notes section of the Individual Core Collection Form. Move to a new coring position in accordance with SOP No. 2 – Positioning. Upon three unsuccessful attempts to obtain  $> 75\%$  penetration, contact Lead Consultant Project Manager to determine if additional cores should be attempted. Proceed to Section 4.2.5, Procedures for Determining Acceptable Core Recovery.

#### 4.2.5 PROCEDURES FOR DETERMINING ACCEPTABLE CORE RECOVERY

1. Calculate recovery percentage by the following equation:

$$\text{Recovery (\%)} = \frac{\text{recovery (feet)} - \text{gaps (feet)}}{\text{actual penetration (feet)}} \times 100$$

2. Record recovery percentage on the Individual Core Collection Form.
3. If recovery is  $\geq 75\%$ , then recovery is acceptable. Continue processing core, then move to a new core location in accordance with SOP No. 2 – Positioning. Proceed to Step 2 of Section 4.2.3 for

collection of second core. If the recovery <75%, proceed to Step 4.

4. If recovery is <75%, then (a) retain core and (b) move to a new coring position in accordance with SOP No. 2 – Positioning. Upon three unsuccessful attempts to obtain >75% recovery, contact PM to determine if additional cores should be attempted.
5. Upon collection of acceptable core(s), proceed to Section 4.2.6 of this SOP, Management of Cores.

#### **4.2.6 MANAGEMENT OF CORES**

1. Containerize excess sediment on the vessel. The field crew will make reasonable attempts to containerize “gross” sediment material produced from coring. Sediment residuals generated from rinsing operations will not be included in such containerization. Dispose of solid material (e.g., core tube, caps, sediment) in accordance with SOP No. 4 – Management and Disposal of Residuals.
2. Verify that the water depth and positioning data have been recorded on the Individual Core Collection Form.
3. Prior to transit to the next coring location or return to the marina, decontaminate the coring equipment and sampling vessel decking as described in SOP No. 1 – Decontamination.
4. Proceed to next core location specified for that day and repeat above procedures.
5. Completed Core Collection and Individual Core Collection Forms will be provided to the Sample Processing Area personnel when relinquishing cores for processing.



## **5.0 QUALITY ASSURANCE**

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Completing the Daily Activity Log, Core Collection Form, and the Individual Core Collection Form provided in this SOP, will document that the process is being followed and that pertinent information is being collected and recorded in accordance with the procedures outlined in this SOP. Entries in the forms will be double-checked by the samplers to verify the information is correct. Completed forms will be reviewed periodically by the FC and/or Project Quality Assurance Officer or their designees to verify that the requirements are being met.

## **6.0 DOCUMENTATION**

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Field notes will be kept during coring activities in accordance with SOP No. 8 – Documenting Field Activities. In addition to information contained in the Daily Activity Log, Core Collection Form, and Individual Core Collection Form, the times of equipment decontamination will be recorded in a logbook.

## **7.0 REFERENCES**

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Tierra. 2007. Newark Bay Study Area Remedial Investigation Work Plan [Rev. 1]. Volume 2 Health and Safety/Contingency Plan. September.

**DAILY ACTIVITY LOG**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
 (Sheet 1 of 2)

|      |  |           |           |
|------|--|-----------|-----------|
| I.   | Date: _____ (1)  |           |           |
| II.  | Vessel Name: _____ (2)   |           |           |
| III. | Personnel (Name/Affiliation/Role):<br>_____ (3)<br>_____<br>_____<br>_____ |           |           |
| IV   | Equipment on Board:  |           |           |
| .    |  | Name/Type | Model No. |
|      | Serial No.   |           |           |
|      | (4)  | (5)       | (6)       |
|      | Coring<br>Device:<br>DGPS:<br>Fathometer:<br>Other:<br>Other:              |           |           |
| V.   | Weather Forecast Checked?: Yes    No    (7)                                |           |           |
|      | Describe Weather:  |           |           |
| VI   | Time of High Tide? (8)   |           |           |
| .    | Time of Low Tide?  |           |           |

**DAILY ACTIVITY LOG**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
(Sheet 2 of 2)

|           |   |         |
|-----------|---|---------|
| VII.      | Date: _____ (1)   |         |
| VII<br>I. | Health and Safety Briefing Topic: _____ (9)               |         |
|           | _____   |         |
|           | _____   |         |
|           | _____   |         |
|           | _____   |         |
|           | _____   |         |
| IX.       | Notification:   |         |
|           | Agency  | Contact |
|           | (10)  | (11)    |
|           | Vessel Tracking Service                                   | (12)    |
|           | _____   |         |
|           | _____   |         |
| X.        | Time of Departure from Marina: _____ (13) _____ (24-hour) |         |
| XI.       | Time of Return to Marina: _____ (14) _____ (24-hour)      |         |
| XII.      | Name of Person Responsible for Log: _____ (15)            |         |
|           | _____   |         |

**DAILY ACTIVITY LOG KEY**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
**(Sheet 1 of 1)**

**DESCRIPTION OF ITEMS:**

- (1) Date of activity (e.g., 1/1/2010).
- (2) Name of vessel performing activity.
- (3) Personnel on vessel, including name, affiliation, and role on the vessel.
- (4) Name or type of equipment (e.g., for DGPS, enter Trimble); if specific equipment type not listed, enter under "Other."
- (5) Model number of equipment (e.g., for DGPS, enter 7400).
- (6) Serial number of equipment (if available).
- (7) Weather forecast checked via marine radio, Newark Liberty International Airport, etc.
- (8) Time of High and Low Tide for the day checked via NOAA/National Ocean Service's website.
- (9) Significant topic(s) discussed at daily health and safety briefing.
- (10) Name of Agency(ies) notified of daily activities.
- (11) Agency(ies) contact name(s).
- (12) Time that Agency(ies) was(were) contacted (24-hour format).
- (13) Time of departure from the marina at the beginning of the day (24-hour format).
- (14) Time of return to the marina at the end of the day (24-hour format).
- (15) Name of person entering information into this form.

| I.                     | Date: _____ (1)<br>Start Time: _____ (2)<br>End Time: _____ (3)   |                             |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------------------------|---|-----------------------------|------------------------------|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| II.                    | Location ID: _____ (4)<br><br>Water Depth and precise time measured _____   |                             |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| III.                   | Physical Description: _____ (5)<br><br>_____<br><br>_____   |                             |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| IV.                    | Weather at Time of Coring:<br><br>- Wind Speed/Direction: _____ (6)<br>- Temperature: _____ (7)<br>- Precipitation: _____ (8)<br>- Cloud Cover: _____ (9)<br>- River State: _____ (10)  |                             |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| V.                     | Confirm ice in core storage container?      Yes                  No                  (11)   |                             |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VI.                    | Cores Collected: (12)<br><table border="1"><thead><tr><th><u>Core ID</u><br/>(13)</th><th><u>Northing (ft)</u><br/>(14)</th><th><u>Easting (ft)</u><br/>(15)</th></tr></thead><tbody><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr><tr><td>_____</td><td>_____</td><td>_____</td></tr></tbody></table> | <u>Core ID</u><br>(13)      | <u>Northing (ft)</u><br>(14) | <u>Easting (ft)</u><br>(15) | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| <u>Core ID</u><br>(13) | <u>Northing (ft)</u><br>(14)  | <u>Easting (ft)</u><br>(15) |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| _____                  | _____   | _____                       |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| VII.                   | Name of Person Responsible for Log: _____ (16)  |                             |                              |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

**CORE COLLECTION FORM KEY**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
**(Sheet 1 of 1)**

**DESCRIPTION OF ITEMS:**

- (1) Date of coring (e.g., 1/1/2010).
- (2) Start time of activities at location (24-hour format).
- (3) End time of activities at location in (24-hour format).
- (4) Location ID.
- (5) Physical description of core location.
- (6) Wind speed and direction at time of core collection (e.g., 10-15 mph from NW).
- (7) Air temperature at time of core collection (e.g., 68°F).
- (8) Precipitation at time of core collection (e.g., light rain).
- (9) Cloud cover at time of core collection (e.g., partly cloudy).
- (10) River state at time of core collection (e.g., 0-1 foot waves).
- (11) Confirm sufficient ice is within core storage container.
- (12) Summary of cores collected at location.
- (13) Core; refer to SOP No. 7 for core identification code.
- (14) Final Northing coordinate of core collection location in feet.
- (15) Final Easting coordinate of core collection location in feet.
- (16) Name of person entering information into this form.



**INDIVIDUAL CORE COLLECTION FORM**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
(Sheet 1 of 4)

|      |   |
|------|---|
| I.   | Date: _____ (1)   |
| II.  | Core ID: _____ (2)<br>Water Depth and precise time measured _____   |
| III. | Sediment Collection Method (circle one): _____ (3)<br><br>- Vibracoring   |
| IV.  | Coordinates:<br><br>Target Coordinates (New Jersey State Plane NAD 83)<br><br>- Northing (ft): _____ (4)<br>- Easting (ft): _____ (5)<br><br>Positioning of Initial Core Attempt Coordinates (New Jersey State Plane NAD 83)<br><br>- Northing (ft): _____ (6)<br>- Easting (ft): _____ (7)<br><br>Confirm initial core location coordinates are within 5 feet of target coordinates <u>(8)</u><br><br>Final Core Collection Location Coordinates (New Jersey State Plane NAD 83)<br><br>- Northing (ft): _____ (9)<br>- Easting (ft): _____ (10)<br><br>Confirm final core location coordinates are within 50 feet of target coordinates <u>(11)</u> |

**INDIVIDUAL CORE COLLECTION FORM**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
 (Sheet 2 of 4)

|       |  |
|-------|--|
| V.    | Date: _____ (1)  |
| VI.   | Core ID: _____ (2)   |
| VII.  | Water Depth at Time of Coring (ft): _____ (12)<br>Precise Time When Water Depth Was Measured _____   |
| VIII. | Start Time of Coring (24-hour): _____ (13)<br>End Time of Coring (24-hour): _____ (14)   |
| IX.   | Penetration:<br><br>- Target Penetration (ft): _____ (15)<br>- Actual Penetration (ft): _____ (16)<br>- Penetration Achieved (Y or N): _____ (17)<br><br>Refusal? (circle one):    Yes        No(18) Depth of Refusal _____  |
| X.    | PID Reading: _____ (19)<br><br><b>Breathing Zone Action Levels:</b><br>For total hydrocarbon levels >5 ppm, upgrade to Level C PPE.<br>For total hydrocarbon levels >25 ppm, stop work.<br>For hydrogen sulfide levels >5 ppm, stop work, evacuate work area, and ventilate. |

**INDIVIDUAL CORE COLLECTION FORM**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
(Sheet 3 of 4)

|       |  |
|-------|--|
| XI.   | Date: _____ (1)  |
| XII.  | Core ID: _____ (2)   |
| XIII. | Recovery: <ul style="list-style-type: none"> <li>- Recovery (ft): _____ (20)</li> <li>- Recovery (%): _____ (21)</li> </ul> $\text{Recovery (\%)} = \frac{\text{Recovery (ft)} - \text{Gaps (ft)}}{\text{Actual Penetration (ft)}} \times 100$ <ul style="list-style-type: none"> <li>- Gaps Identified</li> </ul> <div style="text-align: right; margin-right: 100px;">(22)</div> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p><u>If Recovery (%) ≥ 75%, then</u> recovery is acceptable.<br/> <u>If Recovery (%) &lt; 75%, then</u> refer to SOP No. 3</p> |
| XIV.  | Final Disposition of Core (circle one): _____ (23) <ul style="list-style-type: none"> <li>- Retained for Processing</li> <li>- Rejected</li> </ul> If rejected, reason for rejection: _____ (24) <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/>  |

**INDIVIDUAL CORE COLLECTION FORM**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
(Sheet 4 of 4)

|        |   |
|--------|---|
| XV.    | Date: _____ (1)   |
| XVI.   | Core ID: _____ (2)  |
| XVII.  | Notes (see logbook for additional information): _____ (25)<br>_____<br>_____<br>_____<br>_____<br>_____ |
| XVIII. | Name of Person Responsible for Log: _____ (26)<br>_____   |

Relinquished By \_\_\_\_\_ (27) Company \_\_\_\_\_ (28) Date \_\_\_\_\_ (29) Time \_\_\_\_\_ (30)  
Accepted By \_\_\_\_\_ (31) Company \_\_\_\_\_ (32) Date \_\_\_\_\_ (33) Time \_\_\_\_\_ (34)

Relinquished By \_\_\_\_\_ Company \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_  
Accepted By \_\_\_\_\_ Company \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

**INDIVIDUAL CORE COLLECTION FORM KEY**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
(Sheet 1 of 2)

**DESCRIPTION OF ITEMS:**

- (1) Date of coring (e.g., 1/1/2010).
- (2) Core ID (see SOP No. 7 – Containers, Preservation, Handling, and Tracking of Samples for Analysis).
- (3) Sediment collection method used (e.g., vibracoring).
- (4) Target Northing coordinate in feet.
- (5) Target Easting coordinate in feet.
- (6) Final Position Northing coordinate in feet.
- (7) Final Position Easting coordinate in feet.
- (8) Confirm the initial position location is within 5 feet of the target location.
- (9) Final Northing coordinate of core collection location in feet. This location may be different than (5) due to the adjustment of vessel position for multiple core attempts at the same location.
- (10) Final Easting coordinate of core collection location in feet. This location may be different than (6) due to the adjustment of vessel position for multiple core attempts at the same location.
- (11) Confirm the final core collection location is within 50 feet of the target location.
- (12) Water depth at core collection location in feet.
- (13) Time core collection with vibracoring device is started (24-hour format).
- (14) Time core collection with vibracoring device is finished in (24-hour format).
- (15) Target penetration in feet with vibracoring device.
- (16) Actual penetration of core into sediment. Actual penetration is the depth advanced into the sediment not including the depth advanced to form a sediment “plug.”

$$\text{Actual penetration (ft)} = \text{Penetration (ft)} - \text{“plug” (ft)}$$

**INDIVIDUAL CORE COLLECTION FORM KEY**  
**SEDIMENT AND GEOTECHNICAL INVESTIGATION**  
**(Sheet 2 of 2)**

- (17) Penetration Achieved (Y or N).
- (18) Depth of refusal, if target penetration not achieved.
- (19) PID reading in the breathing zone upon screening core.
- (20) Recovery (ft) = sediment length in core. To identify gaps, visually inspect the core for signs of separation of the sediments within the core, smears on the polybutyrate core tube walls or a water layer within the sediments. Measure the distance between the top and bottom of these interfaces to obtain the length(s) of the gap(s).
- (21) Recovery (%) = sediment length in core per actual penetration.
- (22) Record any gaps identified. Record approximate location (feet below the sediment surface) and the size of the gap (feet). For example, "0.1 foot gap observed at 1.5 feet below sediment surface."
- (23) Final disposition of core (e.g., retained for processing or rejected).
- (24) Provide explanation for rejecting core (e.g., recovery < 75%).
- (25) Provide notes pertinent to core collection (e.g., aborted core collection due to weather); additional details may be provided in logbook.
- (26) Name of person entering information into this form.
- (27) Name of personnel relinquishing core.
- (28) Company affiliation of personnel relinquishing core.
- (29) Date core is relinquished.
- (30) Time core is relinquished (24-hour format).
- (31) Name of personnel accepting core.
- (32) Company affiliation of personnel accepting core.
- (33) Date core is accepted.
- (34) Time core is accepted (24-hour format).